



FEATURES

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The CFT-2200 is Motorola's advanced analog terminal platform. This product is designed to address emerging services and technologies such as interactive program guides, internet access, digital music services, expanded pay-per-view (NVOD), enhanced audio/video and data services, and interactive services. The CFT-2200 transforms a consumer terminal into a broadband multimedia computer capable of generating a wealth of new revenue generating services! The CFT-2200 is also designed to be configurable and upgradable; these products will evolve and grow to meet cable operators' future needs. Motorola also supports cable operators and independent software vendors (ISVs) in defining and creating new applications.

PRODUCT HIGHLIGHTS

The CFT-2200 architecture consists of dual processors: the Secure Processor and the Feature Expansion Module (FEM) Processor. The Secure Processor is a VLSI (very large scale integration) chip containing all security functions, access control and renewable security, and all CFT-2200 standard features such as on-screen display, multilingual OSD, messaging, and 860 MHz tuning support. The FEM contains a micro processor that supports downloadable applications. The FEM delivers a myriad of standard and optional subscriber features. Standard features include a Downloadable User Interface, Interactive Program Guides, and Near Video on Demand (International only). Motorola has designed the CFT-2200 terminal to facilitate a vast array of subscriber features, including those defined today and those yet to be defined. The CFT-2200's dual processor architecture provides an unprecedented level of flexibility and upgradeability while maximizing the system's security by separating the security function from the user and downloadable functions.

Enhanced Messaging

The CFT-2200 offers up to 40 pages of messages and barkers, 15 more pages than the CFT-2000. The extensive messaging capability offered by the CFT-2000 is enhanced in the new 2200 platform. This new product contains expanded memory dedicated to the storage of subscriber messages received on the out-of-band data stream.

Multilingual OSD

The base CFT-2200 terminal allows you to communicate with your subscriber base in more than one language. The Secure Processor can be ordered with two ROM-based language character sets. Example: English/Spanish or English/French. If a subscriber prefers to interact with the set-top terminal in Spanish, simply initialize that particular unit as a Spanish terminal. From then on, the OSD and all ROM barkers will be displayed in the Spanish format. Additionally, in the case of operator-generated messages, operators generate English and a Spanish version of all messages and the system transmits the correct language format to each terminal based on its language designation.

860 MHz Tuner

Every CFT-2200 contains Motorola state-of-the-art integrated tuner technology. This breakthrough design provides increased analog channel capacity (up to 115 channels in NTSC) and eliminates 120 discrete components (approx. 60% of total) and 12 manual adjustments (pots). Integration is through the world's first-ever consumer product use of Gallium Arsenide technology. In addition to offering improved reliability and reproducibility, this technology improves operating performance including phase noise stability and video flatness.

CFT- 2200 FEM & AVAILABLE OPTIONS

- Dedicated micro processor
- TV based internet access
- Downloadable main menu and system logo
- Interactive program guide
- Virtual data channels
- Data port
- IR Blaster (automated VCR control)
- Music Choice
- Zenith/TOCOM Compatibility

Advanced Computer Architecture

The architecture of the CFT-2200 supports a vast array of subscriber features, including those defined today as well as future applications. Motorola offers a dedicated and a multi-thread, multi-tasking operating system. Combined, they enable a rich micro processor programming environment which supports a host of downloadable applications. With optional memory, terminal functionality is extendible through several levels of interactivity.

Internet Access

The FEM supports TV-based Internet access with the integration of WorldGate, a third party Internet service provider. A CFT-2200 with WorldGate FEM supports full-featured Internet access, including web surfing, email, and hyperlinking, without requiring a PC, cable modem, or telephone modem. Data is transmitted to the terminal using available vertical blanking interval, so video bandwidth is not impacted. Data from the terminal is transmitted in the return path via the RF return module so phone lines are not tied up while "surfing the web."

Music Choice

A plug-in module gives the CFT-2200 the capability of simultaneously providing Music Choice and traditional video services in a single terminal. Music Choice is a 30-channel CD-quality audio programming service that provides an exciting, unregulated revenue opportunity. The Music Choice module, the MC/FEM (also known as the digital audio FEM) lets the subscriber watch a video channel or listen to Music Choice audio service. The CFT-2200 allows the subscriber to view information regarding his selection such as title, artist and album through the on-screen display function of the CFT-2200. For physical connections, the MC/FEM includes a Sony Philips Digital Interface Port (SPDIF) via a RCA jack on the back of the module. The SPDIF is important since it completes the last leg of an all-digital path to the subscriber's stereo system. In addition, standard analog audio capability is achieved via left and right channel outputs on the CFT-2200. These connections are also RCA jacks. In addition to providing Music Choice, the MC/FEM has Digital Audio Security (DAS) capability. DAS is a security feature where the normal analog audio is removed from a channel and replaced by a digital audio signal. This method in effect doubles the stakes for pirates by scrambling the video and audio by different methods. As with the Motorola baseband scrambling system, the operator has the option of implementing this system using his choice of any combination of channels.

Interactive Program Guide

A key optional feature of the CFT-2200 is the Motorola Interactive Program Guide (IPG) application, available through the FEM. The IPG provides seven days (depending on the number of channels and memory selected) of program titles and details presented in a grid guide format. (IPG data must be purchased separately from a data provider.) Thanks to the multiple foreground and background colors available for each character, the grid design has a three-dimensional appearance. Subscribers use cursor keys to navigate through rows of program channels and columns representing half-hour time increments. If the selected program is within the current time window, the channel that carries the program is automatically tuned, providing point & shoot tuning. With the addition of an optional IR blaster, the viewer can select current and future programs for unattended recording (point & shoot recording). The Motorola IPG application uses color, title bars, highlighting, upper and lower-case character fonts, and function keys for viewer understanding. For example, by pressing the dedicated help key, instructions appear which explain the functions that can be executed in each screen. The Motorola IPG interfaces seamlessly with our Near Video on Demand applications (NVOD). Programs offered through the NVOD system are listed by title in any of the IPG screens that list programming. NVOD program fields are the same color as PPV, Promo, and premium program fields. The IPG also interfaces with the operator's PPV system. To select PPV or NVOD, the viewer moves the cursor to the desired program and presses the SELECT key; this ports the viewer to the On Screen Display system and the appropriate IPPV purchase screens. The Motorola IPG mini-guide enables the viewer to learn what is on now and next on other channels while watching the current program. With mini-guide, the viewer can display more information about a program or directly tune to another program on a different channel.

ROM-Coded or Downloaded IPG

The CFT-2200 supports branded IPGs such as StarSight™, TV Guide, or Prevue in the FEM. Using the Motorola application programming interfaces (APIs), independent software vendors (ISVs) such as StarSight can develop their own look and feel within the user processor platform.

Downloadable Main Menu

You can change the CFT-2200 on-screen display menu to maximize your system's marketing effectiveness.

These parameters can be changed:

- .-The order of menu items (Example: *Buy-a-Program* could be selected as the first item on the main menu)
- .-The title assigned to each menu item (Example: *Buy-a-Program* could be renamed *Rent-a-Movie*)
- .-Menu items can be deleted

Downloadable System Logo

The CFT-2200 enables the customization of its menus and messages by downloading a company logo to the corner of each screen. System logos can be defined at the pixel level using a Motorola Data Provider Translator. On request, the utility will change the logo to an array of characters; then, the logo can be included in character messages downloaded to the CFT.

Virtual Data Channels

The user processor also delivers enhanced services such as virtual data channels-text-based screens conveying such information as sports statistics, stock quotes, or weather data. Through virtual channels, you can expand the number of services offered to the subscriber through improved spectrum utilization thanks to its in-band capability.

In-band Data

Each analog channel can carry one or two data channels at an effective rate of 9600 baud. This data is to be used with video-related services such as song lyrics, purchase information, sports statistics, game scores, etc. The data may be subject to Motorola access control, which limits its use to modules in authorized subscriber terminals. Likewise, the data may be identified as purchasable, and be used to describe some item shown on the screen. The CFT-2200 provides a message to allow impulse purchasing of in-band data (or the items associated with the data).

Data Port

The CFT-2200 can be equipped with an optional RS-232 serial data port to interface with a peripheral device such as a printer or fax machine.

IR Blaster

For VCR control from the set-top terminal, Motorola offers an IR blaster. The device consists of a low-power transmitter packaged in a small housing attached to a six-foot cord. A mini-pin-type jack connects the blaster to the terminal. Once installed, the IR blaster can be automatically activated through either the VCR Timer feature or the electronic program guide. Rather than burdening each CFT with a chip containing the library of VCR device codes, the library is maintained on the Data Provider Translator in the headend. Individual VCR codes are broadcast through an in-band channel that is tuned by the CFT-2200 as needed. Another option available in combination with the MC/FEM is the Audio Bypass Switch (ABS). If a subscriber has a BTSC stereo decoder-equipped TV, the ABS automatically permits stereo listening on television via the subscriber's home stereo, which is already cabled via the Music Choice module.

Near Video On Demand (NVOD) (International Only)

The CFT-2200 terminal offers an optional enhanced pay-per-view ordering system that supports NVOD services. This system lets you offer pay-per-view movies with multiple start times per hour. The NVOD ordering system provides a downloaded database of movie titles, descriptions, and start times to the terminal which the subscriber accesses through the on-screen displays. The key features of the NVOD ordering system are:

- Up to 12 start times per hour per title
 - Pause, Fast Forward, Rewind
 - Movie titles and descriptions
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Zenith/Tocom Compatibility

The CFT-2200 can be factory-ordered to be Zenith- or Tocom-compatible. A CFT-2200/Z (Zenith) or CFT-2200/T (Tocom) consists of standard terminal (CFT-2200) equipped with special Zenith Z-Tac descrambling circuitry or Tocom descrambling circuitry. The MVP-II/Z or MVP-II/T is used to insert Motorola-formatted data on clear video. This is then fed to the Zenith or Tocom encoder for scrambling and communications. The MVP-II/Z supports Zenith sync suppression and video inversion scrambling modes. The MVP-II/T supports all Tocom scrambling modes. The video output of the Zenith- or Tocom-compatible MVP-II provides the video source for their respective encoders. Hardware modification of the Zenith or Tocom encoder is not required, nor is there any change in the operation of either system. The only change consists of installing a MVP-II/Z or MVP-II/T in every channel to be descrambled by a Zenith- or Tocom-compatible Motorola terminal. The MVP-II/Z and MVP-II/T are field-upgradeable to standard Motorola MVP-IIs.

**Specifications
 NTSC Video Specifications**

Input Frequency	54-860 MHz (excluding data carrier frequency) HRC/IRC Frequency
Frequency Assignments	Download
Number of Channels	115 channels per cable; one or two cables (less 2 channels; one for data frequency and for OSC.) Optional A/B (field upgradable) LED in front display
Dual A/B Cable Switching A/B Cable Switching	Optional A/B (field upgradable) LED in front display
Input Video Level	0 dBmV + 15 dBmV
Input Sound Level	-10 to -17 dBc
Data Carrier	FSK Modulated FM Carrier
Frequency	89.5, 97.5, 106.5, 108.5 MHz
Bandwidth	±200 kHz standard FM
Level	-15 dbmV
Video S/N	48 dB @ 0 dBmV input level
Output Frequency	±150 kHz
Accuracy	
Return Loss:	
Input	5 dB Min.
Output	8 dB Min.
Spurious:	
Output	-57 dBc Max., in band
Cross Modulation Distortion	-57 dB (113 channels, each @ + 15 dBmV)
Composite Second Order Distortion	-56 dB (113 channels, each @ + 15 dBmV)
Second Order Distortion	-60 dB (113 channels, each @ + 15 dBmV input level)
Composite Triple Beat Distortion	-56 dB (113 channels, each @ + 15 dBmV input level)
Converted Input Beats (with all Input Signals)	-25 dB (115 channels, each @ + 15 dBmV)
Hum Modulation Distortion	3 IRE

Output Level	10 to 15 dBmV
Isolation (Input/Output)	70 dB Min.
Differential Phase	10 degrees (Max.)
Differential Gain	10 degrees (Max.)
Scrambling Method	Gated Sync Suppression Dynamic Gated Sync Suppression Video Inversion Audio Privacy Hamlin Zenith Tocom SA Sync Suppression
On Screen Display	
Character Size:	18x12 pixels (in 12x24 screen size)
	12x8 pixels (in 16x32 screen size)
Screen Size:	12 rows x 24 columns
	16 rows x 32 columns
Message/Barker Capacity:	40 Pages
Channel Descriptors:	5 characters, Max.
Mechanical Security (standard)	Security screws; security pin; uni-chassis construction
Operating Temperature Range	59°F to 104°F (15°C to 40°C)
Operating Humidity Range	5% to 95% (non-condensing)
AC Voltage	105 Vac to 125 Vac @ 60 Hz
Power Dissipation	24 Watts at 115 Vac
Surge Protection	Surge protection provided on power supply and RF ports
Size	13.0" x 8.53" x 2.875" (LxWxH)
Weight	7.0 lbs.

PAL B/G Video Specifications

Input Frequency	54-860 MHz (excluding data carrier frequency) HRC/IRC Frequency
Frequency Assignments	Download
Number of Channels	100 channels per cable; one or two cables (less 2 channels; one for data frequency and for OSC)
Input Video Level	0 dBmV + 15 dBmV
Input Sound Level	-10 to -17 dBc
Data Carrier	FSK Modulated FM Carrier
Frequency	106.5, 108.5 MHz and others
Bandwidth	±200 kHz standard FM
Level	-15 dBmV
Video S/N	48 dB @ 0 dBmV input level
Output Frequency	±150 kHz
Accuracy	
Return Loss:	
Input	5 dB Min.
Output	8 dB Min.
Spurious:	
Output	-57 dBc Max., in band
Cross Modulation Distortion	-57 dB (100 channels, each @ + 15 dBmV)
Composite Second Order Distortion	-56 dB (100 channels, each @ + 15 dBmV)
Second Order Distortion	-60 dB (100 channels, each @ + 15 dBmV input level)
Composite Triple Beat Distortion	-56 dB (100 channels, each @ + 15 dBmV input level)
Converted Input Beats (With all Input Signals)	-25 dB (100 channels, each @ + 15 dBmV)
Hum Modulation Distortion	3 IRE
Output Level	10 to 15 dBmV
Isolation (Input/Output)	70 dB Min.
Differential Phase	10 degrees Max.
Differential Gain	10 degrees Max.

Scrambling Method	Gated Sync Suppression Dynamic Gated Sync Suppression Video Inversion Audio Privacy Hamlin Zenith Tocom SA Sync Suppression
On Screen Display	
Character Size:	18x12 pixels (in 12x24 screen size) 12x8 pixels (in 16x32 screen size)
Screen Size:	12 rows x 24 columns 16 rows x 32 columns
Message/Barker Capacity:	40 Pages
Channel Descriptors:	5 characters, Max.
Mechanical Security (standard)	Security screws; security pin; uni-chassis construction
Two-way System Compatibility	STARVUE® RF return
Operating Temperature Range	59°F to 104°F (15°C to 40°C)
Operating Humidity Range	5% to 95% (non-condensing)
AC Voltage	220 Vac to 240 Vac @ 60 Hz
Power Dissipation	16 Watts at 220 Vac
Surge Protection	Surge protection provided on power supply and RF ports
Size	13.0" x 8.53" x 2.875" (LxWxH)